

REMARKS

Claims 14-27 and new Claims 28-30 are active in this application. Reconsideration is respectfully requested.

Applicants' representative wishes to thank Examiner Bissett for the helpful and courteous interview of March 15, 2004. As a result of the discussion it is believed that the issues in the case have been clarified and that the prosecution of the application has been materially advanced.

Claim Amendments

Claim 14 has been amended to recite that the light that is incident on the heat insulating medium of the invention is ambient light that is particularly well understood in view of the manner of use of the heat insulating medium in such applications as the insulation for residential, office and industrial buildings (page 1, lines 8-13) to mean the light of the environment. Accordingly, the amendment that has been made to Claim 1 is believed not to have introduced new matter into the case and entry of the amendment into the record is respectfully requested.

A number of the claims have been amended to make minor changes thereto that are believed to improve upon the form of the claims. No new matter is believed to have been added to this application by these amendments. Entry of the amendments into the record is respectfully requested.

New Claims 28-30 are supported by Examples 1-3 of the application. Entry of the claims is respectfully requested.

Invention

The discovery of the present invention is that it is possible to provide a heat insulating medium based on one or more cholesteric layers which is completely transparent to visible radiation and which absorbs very little of near infrared and visible wavelengths incident on the coating. Accordingly, the invention as claimed is directed to a heat-insulating coating, which comprises one or more non-micellar cholesteric layers, each reflecting at least 40 % of ambient radiation that is incident on the heat insulating coating in the infrared wavelength range above 750 nm.

Prior Art Rejection

Claims 14, 16-21 and 23-27 previously on the record stands rejected based on 35 USC 102(b) as anticipated by Nippon Sheet Glass. This ground of rejection is respectfully traversed.

As argued by applicants' representative indicated at the interview, an amendment of Claim 14 which recites that the light that is incident on the heat reflecting coating of the invention is "ambient" light, which by necessity means that the light is constituted of an equal distribution of wavelengths of light having right-handedness and left-handedness, is sufficient to establish that the light which is incident on the heat reflecting coating of the invention is not the light that the reference shows as incident on a laminate in the Examples of the Nippon reference. As applicants have stated on the record previously, it is practically impossible for a specific cholesteric layer to reflect more than 50 % of radiation incident thereon of a specific wavelength. The reason for this is that because a cholesteric layer is

composed of liquid crystalline material which forms a helical super structure of specific handedness, only a fraction of the light of a specific wavelength which is incident on a layer, i.e., a fraction with identical handedness, will be reflected by the cholesteric layer. Because normal stray (ambient) incident light consists of radiation of left-handedness and right-handedness, only 50 % of the incident light theoretically can be reflected. (Applicants refer to the discussion in the preliminary response filed September 22, 2003 for a detailed discussion of the handedness of ambient or stray light.) On a practical basis, however, the percentage of reflected light from such layers is significantly below the 50 % value.

On the other hand, one of skill in the art considering the disclosure of Nippon Sheet Glass would understand with respect to Fig. 1 of the reference that light of a specific handedness must have been used in the experiments yielding the data of Fig 1, because, for each of the three cholesteric polymer films, a reflectivity of about 75 % was observed, i. e., 83 % minus 8 %(which is the baseline of the spectrum shown). If the same cholesteric layers had been investigated with “normal light” consisting of equal proportions of left-handed and right-handed light, a reflectivity of 37.5 % would have been observed ($75 \% \div 2$). On the other hand, however, the cholesteric layers of the coating of the present invention show significantly improved reflectivity per layer of at least 40 %. This is clear from the last paragraph of Example 1 on page 43 of the present specification which mentions that a cholesteric layer exhibits a reflection of 47 % of incident light. Moreover, by incorporating a $\lambda/2$ film in the heat-insulating coating, reflectivities of about 89 % (about 45 % per layer) can be obtained as described in Example 2 of the text. It is therefore clear that the claimed heat-insulating coating of the present invention is not anticipated by the reference because the

reference only discloses the incidence of light of a specific handedness on a laminate or coating of light reflecting layers. Moreover, applicants submit that the disclosure of Nippon Glass would not motivate the skilled artisan to improve upon the reflectivity characteristics of the cholesteric films of the reference to achieve the level of effectiveness of the present invention.

As applicants also have previously pointed, Fig. 1 of the Nippon Glass reference clearly shows that the mid-peak width of the reflection peaks of the combination of three cholesteric films can be estimated to be less than 250 nm. This means that the mid-peak width of each film is significantly less than 83 nm because the three films produce peaks of almost identical geometry. In the present invention, however, the cholesteric layers prepared have a significantly wider mid-peak width. As is clear from Example 3 (see new Claim 30) of the present specification, mid-peak widths of as high as 121 nm can be achieved. This fact is important from the viewpoint of practicability because the number of cholesteric layers required to reflect a certain wavelength range can be further decreased which simplifies the preparation of heat-insulating coating compositions based on cholesteric polymer films.

In view of the comments above, it is believed that the present claims have been distinguished over the Nippon reference and withdrawal of the rejection is respectfully requested.

Claim 15 stands previously rejected based on 35 USC 102(b) as anticipated by Nippon Sheet Glass. This ground of rejection is believed obviated on the basis of the discussion above and therefore withdrawal of the rejection is respectfully requested.

Appln. No. 09/509,548
Reply to Office Action of January 21, 2004

Claim 22 stands previously rejected based on 35 USC 102(b) as anticipated by Nippon Sheet Glass in view of G. B Patent 2,132,623. This ground of rejection is believed obviated on the basis of the discussion above and therefore withdrawal of the rejection is respectfully requested.

Appln. No. 09/509,548
Reply to Office Action of January 21, 2004

It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Frederick D. Vastine, Ph.D.
Registration No. 27,013

Customer Number
22850

TEL: 703-413-3000
FAX: 703-413-2220
NFO/FDV